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**SPACE-AGE
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**FROM
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Publications

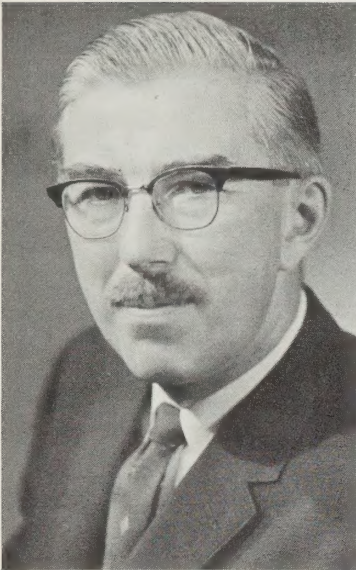


CANADA

AT THE NORTHEAST ELECTRONICS RESEARCH
AND ENGINEERING MEETING STAND 1-F-11
WAR MEMORIAL AUDITORIUM BOSTON
NOVEMBER 3 TO 5, 1965

PRODUCED BY
THE DEPARTMENT OF TRADE AND COMMERCE
OTTAWA, CANADA

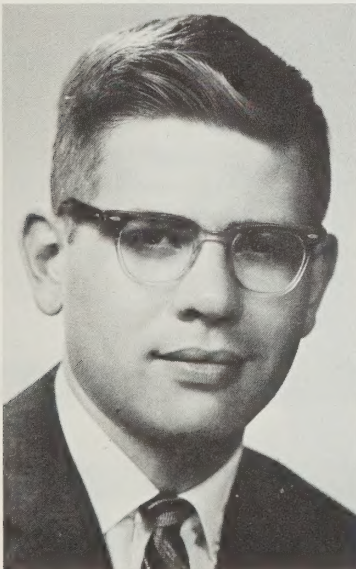
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M. R. M. DALE
CONSUL AND SENIOR
TRADE COMMISSIONER

We take pleasure in welcoming you to the Canadian Exhibit at the Northeast Electronics Research and Engineering Meeting in the War Memorial Auditorium, Boston, November 3 to 5, 1965. This booklet lists the Canadian exhibitors and describes the outstanding products they have to offer. Representatives of the exhibiting companies and the Canadian Department of Trade and Commerce will be pleased to answer inquiries, and a representative of Canada's Department of Defence Production will be present to discuss questions relating to the Canada-United States Defence Production Sharing Program. Information on the full range of quality products and services available from Canada can be obtained at any time from this office or any of the other Canadian trade offices in the United States.

A handwritten signature in cursive script, appearing to read "M. R. M. Dale".



D. S. BAKER
VICE-CONSUL AND
ASSISTANT TRADE
COMMISSIONER

M. R. M. Dale
Consul and Senior Trade Commissioner
Canadian Consulate General
607 Boylston Street
Boston, Massachusetts, 02116
Tel: 262-3760 (Area Code 617)

FROM CANADA FOR PROGRESS IN ELECTRONICS

Since September 28, 1962, when Canada became the third world power in space with the launching of the Alouette sounding satellite, the Canadian electronics industry has won recognition for its role in space research.

With the success of the Alouette I, the Canadian Government and private industry became partners in an accelerated space program. More than 125 electronics manufacturing plants — most specializing in the production of component parts which have to pass the most rigid specifications — are in operation across the country. They employ 65,000 people and annual sales at home and abroad total more than \$620 million a year.

The Canadian electronics industry has become much larger and more enterprising than might be expected in a country with a relatively small population. It is a leader in long-distance communication with the development of a 10,000-mile microwave communications system — the longest in the world — to link the scattered Canadian population from coast to coast.

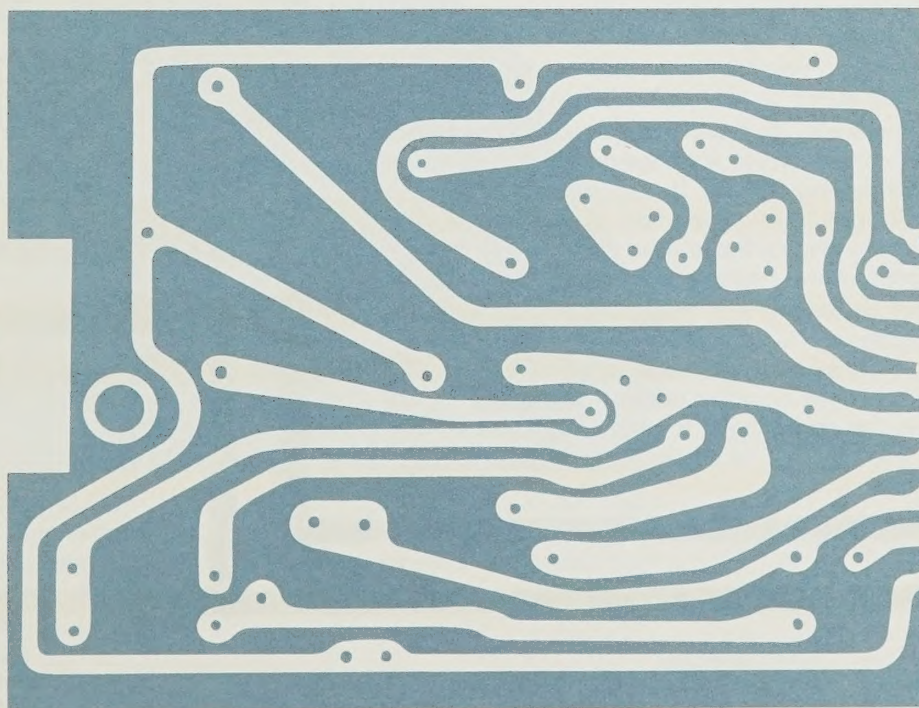
A team of research scientists from Montreal's McGill University is currently playing a major role in the joint Canada-U.S. High Altitude Research Project (HARP) which may ultimately result in vehicles being launched into orbit by the use of a gun. HARP scientists are developing methods of controlling the altitude of a vehicle which will be boosted into orbit by rocket stages after the initial gun launch. If experiments are successful, Canada will become the third world power to develop its own method of launching satellites.

The Canadian electronics industry can supply complete communications satellite ground stations capable of handling 600 voice channels or television via synchronous or non-synchronous satellites similar to those which will be launched by Communications Satellite Corporation. An experimental station with an 85-foot-diameter radium-enclosed antenna is nearing completion at Mill Village, Nova Scotia, for operation with the National Aeronautical Space Administration's Advanced Technological Satellite Program.

Canada's electronics producers have earned an international reputation for reliability and originality. They have become leaders in long-distance communication systems, remote control, sophisticated instrumentation — particularly for nucleonics, test equipment, industrial computers and analyzers, defence systems, geophysical instruments and space-age navigational aids.

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BARRINGER RESEARCH LIMITED

145 Belfield Road
Rexdale, Ontario, Canada
Tel: 247-2193 (Area Code 416)

TECHNIQUES AND INSTRUMENTS FOR THE EARTH SCIENCES

Barringer Research Limited specializes in the design and development of new instruments and techniques for geophysical and geochemical exploration.

One of the company's major developments is the INPUT (induced pulse transient) airborne electromagnetic system, extensively used in mineral exploration in southwest United States, Australia and Canada. Disseminated sulphides of the copper porphyry type have been located by this system. The United States Geological Survey has installed the INPUT system in its geophysical aircraft to assist in geological mapping.

A range of nuclear precession magnetometers — providing absolute measurement of the intensity of the earth's magnetic field — has been developed by Barringer Research. The range includes an airborne/oceanographic magnetometer (AM-101A) with a one-gamma sensitivity, a portable ground magnetometer (GM-102) with a 10-gamma sensitivity, and a station magnetometer (GM-103) with a one-gamma sensitivity. The latter is produced with a playback system and digital recorder (DR-101), enabling the magnetometer to operate unattended for a month.

The AM-101A nuclear precession magnetometer is a high-sensitivity, fully transistorized compact unit providing a direct readout of the absolute value of the earth's magnetic field in one or five-gamma units.

Using unique patented circuitry, the equipment converts the nuclear precession frequency into a digital output directly proportional to the earth's total magnetic field and adjustable to read in fundamental units.

The company's portable magnetometer provides rapid, low-cost surveys. Measurements are made in three seconds and the set is operated by one man. The GM-102 has been extensively field proven in extremes of Canadian cold and Australian heat. A design breakthrough allows operation on dry cell batteries.

A recent development is the Barringer mobile mercury spectrometer for detection of minerals or underground nuclear explosions. The equipment, mounted on a truck or a light aircraft, monitors the presence of mercury in the atmosphere. It can detect substantially less than one millionth of a gram of mercury in a cubic meter of air.



Easily operated by one man, the Barringer portable GM-102 magnetometer can make measurements of magnetic field in three seconds.

Represented by:
Barringer Research Inc.
16 Huron Drive
East Natick, Massachusetts, 01762
Tel: 655-2061 (Area Code 617)

CENTRAL DYNAMICS LIMITED

147 Hymus Boulevard
Pointe Claire, Quebec, Canada
Tel: 697-0810 (Area Code 514)

TELEVISION TERMINAL EQUIPMENT

Since its establishment in 1958, Central Dynamics Limited has expanded rapidly. Stimulated by top engineering graduates from the world's finest universities, a determined "pride of workmanship" spirit sparks every phase of the company's operation.

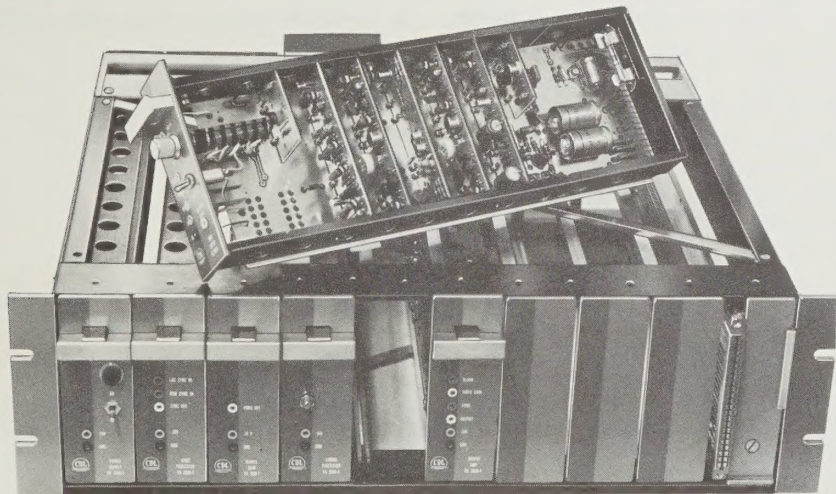
Central Dynamics designs and fabricates television broadcast equipment — including video distribution amplifiers, pulse distribution amplifiers, video mixing amplifiers and audio/video switchers. It produces temperature measurement and control instrumentation for the petrochemical and processing industries as well as various electronic systems.

The company designs and manufactures audio/video switchers and associated amplifiers for black and white and color application, and also custom packages these components for related fields.

On display is the solid-state video signal processing amplifier designed with intricate feedback circuitry for high stability. The 2080 maintains precise sync/video signal amplitudes in studio and master control switchers, eliminates hum and low-frequency disturbances. Its modular construction allows extra modules — for example, remote gain-and-fade and chroma processor — to be added to the basic unit when required. Processing amplifiers are used at the output of studio switching systems and at the point where the television network signal enters a broadcasting installation. They are also used in conjunction with television transmitters and video tape recorders.

The solid-state pulse regenerative type 2051 distribution amplifier reshapes the pulses fed to it for distribution and eliminates distortion. Each amplifier gives four identical outputs. An optional feature is visual indication of output pulse presence.

Also on display is the CDL VMA-2070 video mixing amplifier, a solid-state unit with exceptional monochrome and color performance. It is used for mixing and superimposing two video signals, and fading either of them to or from black. It may be used for replacement of older types in existing switcher installations.



Central Dynamics Limited manufactures a broad range of audio/video switchers and associated amplifiers for black and white and color studio application. This 2080 video signal processing amplifier eliminates hum and low-frequency disturbances in composite network, videotape or remote signals.

Represented by:

Ward Electronic Industries Inc.
1414 East St. George Avenue
Linden, New Jersey, 07036
Tel: 925-4690 (Area Code 201)

DEPARTMENT OF DEFENCE PRODUCTION

123 Slater Street
Ottawa 4, Ontario, Canada
Tel: 992-3456 (Area Code 613)

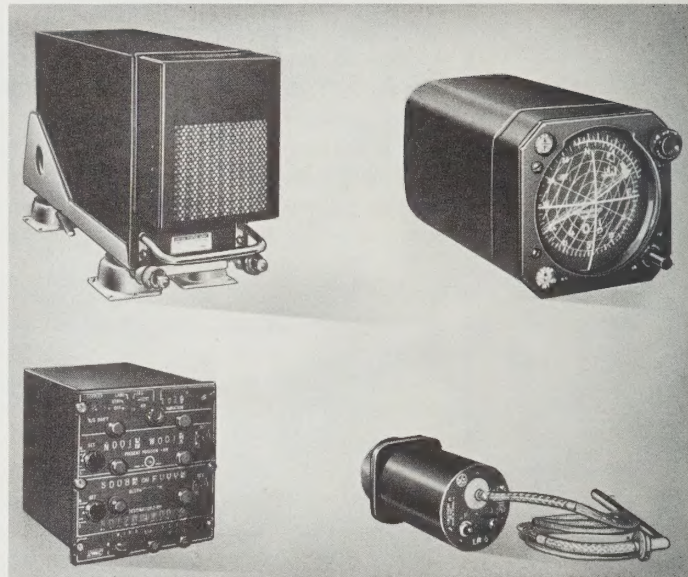
CANADA-UNITED STATES DEFENCE DEVELOPMENT AND PRODUCTION SHARING

Canadian industry supplies material for U.S. defence programs under the Canada-United States Defence Production Sharing Program which effectively adds Canadian sources to U.S. domestic source lists for defence equipment.

Under the program of co-operative development between our two countries, Canadian industry is able to utilize its scientific and technical resources to develop items for United States requirements.

The objectives of the program are increased Canadian participation in supplying North American defence weapons systems, and long-range co-ordination of the defence production and development of the two nations. Therefore Canadian defence industry is allowed equal opportunity to participate in meeting United States defence requirements.

The Canadian Department of Defence Production administers Canadian activities under the program. United States firms are invited to investigate the many advantages of procurement from Canada. Inquiries may be addressed to the Director of the International Programs Branch, Department of Defence Production in Ottawa.



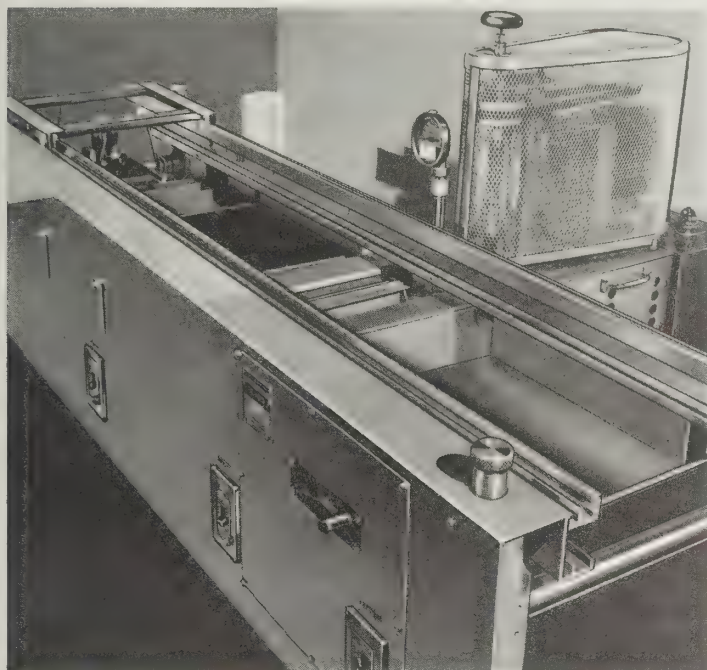
Components of the airborne doppler navigation system developed in Canada under the Canada-United States Defence Development Sharing Program. The system has been sold to all three armed services in the United States. Top row, from left: navigational computer, velocity steering indicator; bottom row: control indicator, true airspeed indicator.

Represented by:

J. F. MacLeod, Liaison Officer
Canadian Department of Defence Production
L. G. Hanscom Field
Bedford, Massachusetts, 01731
Tel: 274-9096 (Area Code 617)

ELECTROVERT MANUFACTURING CO. LIMITED

3285 Cavendish Boulevard
Montreal 28, Quebec, Canada
Tel: 488-2521 (Area Code 514)



The Electrovert 319 Solderette, a completely enclosed system for wavesoldering printed circuit boards. The compact unit consists of fluxing, flux drying, pre-heating and soldering stations.

Represented by:

Electrovert Inc.
240 Madison Avenue
New York, N.Y., 10016
Tel: 683-7191 (Area Code 212)
Contact Associates
7 Cypress Drive
Burlington, Massachusetts, 01804
Tel: 272-5051 (Area Code 617)

WAVESOLDERING SYSTEMS AND EQUIPMENT

The company that introduced the first wavesoldering unit to North America, Electrovert Manufacturing Co. Limited, ranks among the world's leading producers of wavesoldering systems and equipment.

On display is the Electrovert Model 319, an efficient, compact, low-cost and integrated system for fluxing, pre-heating, and wavesoldering printed circuit boards. The system includes an automatic chain conveyor, board-holder carrier, foam fluxer, infra-red panel heat-bank and Solderette wavesoldering unit.

The unique design and precision controls of the system permit maximum versatility and are capable of accommodating most low-to-medium soldering operations. All controls are conveniently positioned on the front panel for easy access and simplified operation.

In operation, the printed circuit board is carried across the wave of the fluxing station and a thin, uniform coating of foam flux is applied to the board's underside. The board then passes over the pre-heating station where the flux solvent is evaporated and the board thermally conditioned for soldering.

Carried at a steady rate of speed, which is adjustable to meet individual board conditions, the board moves onto the soldering station. This unit pumps molten solder upward, forming a precisely controlled constant-temperature cross-free wave. The crest of this wave "kisses" the underside of the board as it passes, forming a perfect solder joint without damage to components. Where the application of oil to solder is required, the soldering unit can be equipped with the Positrol forced oil injection system.

Electrovert manufactures a complete line of wave-soldering systems and auxiliary units used in the solder processing of printed circuit boards. These include a variety of fluxing, pre-heating, soldering and cleaning units which can be incorporated as stations into its modular systems.

Electrovert's unique pumping principle produces a molten solder wave that is smooth and laminar in flow, constant in temperature — plus or minus one degree centigrade — adjustable in height, and available in a variety of widths to meet individual requirements. The same pumping principle is used in Electrovert's wave fluxing and wave cleaning equipment. Electrovert systems, in addition to being used for printed circuit boards, have been adapted with outstanding results to such applications as telephone circuit plates, component assemblies, armature windings, and component leads.

E.M.I. - COSSOR ELECTRONICS LTD.

P.O. Box 1005
Dartmouth, Nova Scotia, Canada
Tel: 466-7491 (Area Code 902)

IONOSPHERIC SOUNDING EQUIPMENT

From the research laboratories of E.M.I. - Cossor Electronics Ltd. comes a new concept in the field of ionospheric measurement — the Model 8000 Ionosonde.

This ionospheric sounder is compact and lightweight and does not require a team of highly skilled personnel to operate it. By using solid-state circuitry and other advanced techniques, E.M.I. - Cossor has produced vertical/oblique sounding terminal equipment which can be carried and operated by one person.

With this unique system, ionospheric observations are now possible in vehicles on land, in the air and on the water.

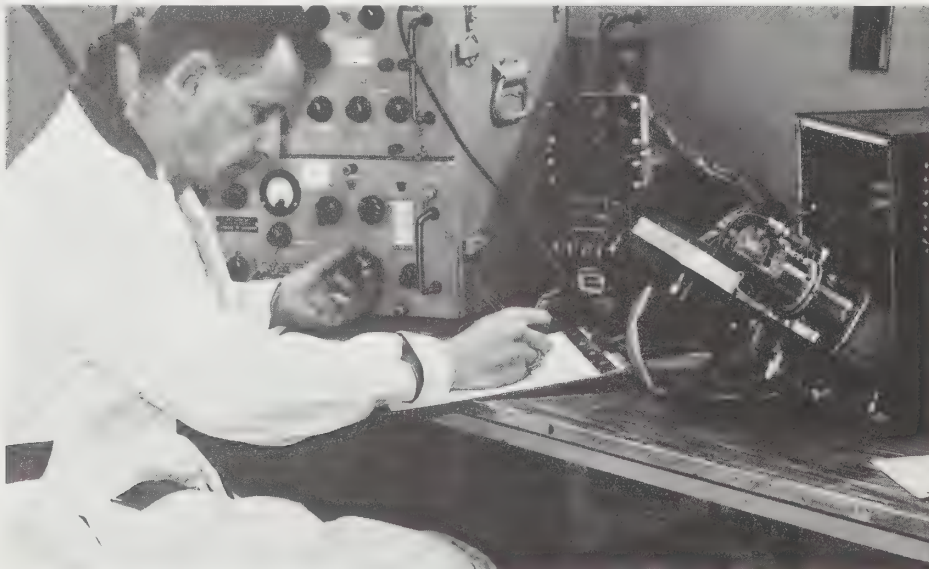
Also displayed is the company's HF sounding system, manufactured according to the requirements of the U.S. Defence Communications Agency. The equipment meets all relevant MIL specifications and withstands the rugged conditions for environmental testing specified in MIL-E-16400.

Founded in 1950, E.M.I. - Cossor is a member of the world-wide E.M.I. Group of Companies. The 73,000-square-foot Dartmouth plant, with a technical staff of almost 500, is equipped to manufacture light or medium electronic and electro-mechanical equipment and components — in production or prototype quantities.

The company has the research, development and manufacturing facilities to produce anti-submarine warfare products; underwater electro-acoustics for military and commercial applications; air, ground and sea communications; direction-finding systems; ionospheric sounding equipment; antennas of all types; ECM and ECCM equipment; audio, public address and intercom systems; and industrial electronic instrumentation.

E.M.I. - Cossor exports ionospheric sounding equipment, variable depth sonar and other ASW systems as well as Radiac training equipment to the United States, England, France, Holland, Denmark, Sweden, Norway, Australia and India.

The company is also engaged in the Canada-United States Defence Production Sharing Program.



Skilled technicians at E.M.I. - Cossor Electronics Ltd. test and calibrate all equipment before shipment. This technician is performing final electrical tests on an I.F.F. transponder and coder-decoder equipment.

Represented by:

Warren P. Scott
Naeco Associates Inc.
733 - 15th Street, N.W.
Washington, D.C., 20005
Tel: 393-0451 (Area Code 202)

FERRANTI-PACKARD ELECTRIC LIMITED

Electronics Division
Industry Street
Toronto 15, Ontario, Canada
Tel: 762-3661 (Area Code 416)

PAPER-TAPE READERS, INFORMATION DISPLAY SYSTEMS, MEMORY DRUMS

A major name in the electrical industry since 1894, Ferranti-Packard Electric Limited maintains one of the foremost research facilities in Canada, employing more than 1,800 skilled engineers, technologists and scientists.

The company has established a reputation for progressive leadership through research, development and the manufacture of superior electrical and electronic products for commercial, industrial and military application.

Ferranti-Packard is displaying three models of high-speed photoelectric paper-tape readers in the range of 300 to 600 characters per second. These tape readers, for commercial and military applications, have a proven service life of at least 50,000 hours with a maximum of 10,000 hours of continuous operation before a major overhaul. Several of the company's models are used in prime military systems.

A unique information display system using punch paper tape as the drive medium is exhibited. The company has designed, developed and manufactured these systems since 1959. A 12,800-character system has been recently installed in the premises of the Montreal and Canadian Stock Exchanges in Montreal.

The coils in a display panel are interconnected to form horizontal rows and vertical columns. A pulse on a row and a column will cause only the dot at the intersection to change. Characters, symbols or curves can be shown at speeds to 5,000 dot changes a second.

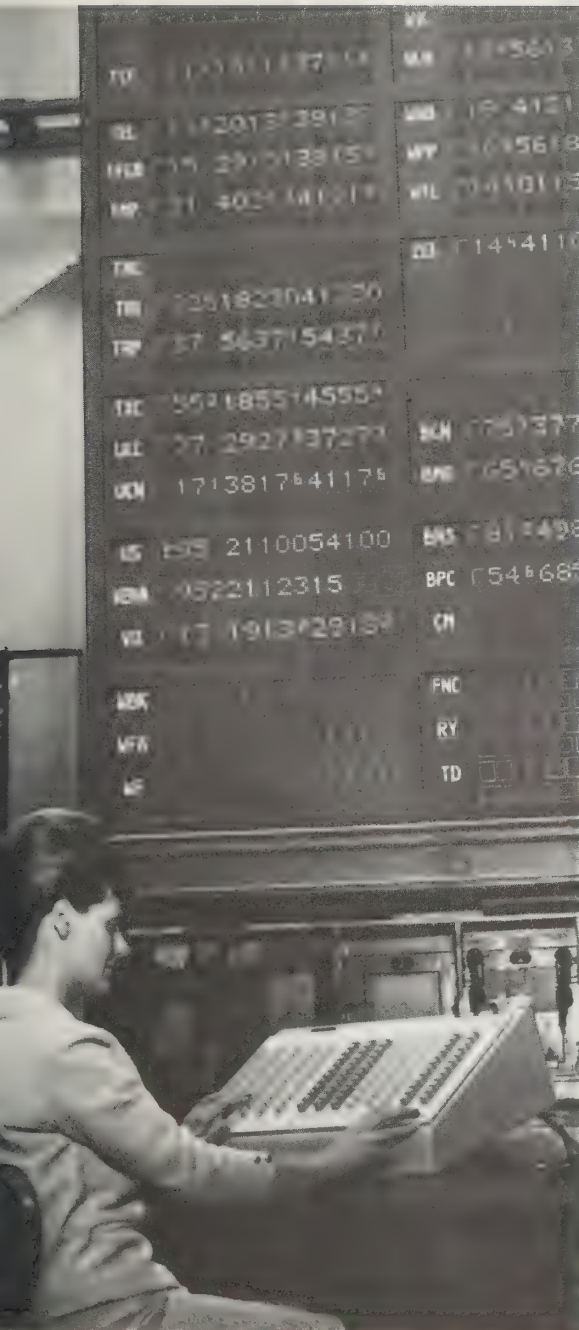
The device operates on a unique gating principle rather than on algebraic addition of ampere-turns. For example, a double current (24 amperes) in one winding will not result in any change to the associated dots unless there is a current of approximately 12 amperes in the other winding.

This system can be used for arrival-departure boards at transportation terminals, score boards for sporting events, stock and commodity exchange boards, and for other applications where fast, frequent changes of information are continually posted. The new system depends on reflected light for legibility and is specially suited to installations where a high ambient light level exists.

Another company product on display is the 371-14 air-floated head magnetic memory drum, utilizing bit stacking densities in excess of 400 bits to the inch.

Represented by:

E. A. Janse Associates
892 Worcester Street
Wellesley, Massachusetts, 02181
Tel: 235-1623 (Area Code 617)



This young lady is operating the single stock quotation board and input units developed by Ferranti-Packard and installed at the Montreal and Canadian Stock Exchanges.

GUILDLINE INSTRUMENTS LTD.

Smiths Falls, Ontario, Canada
Tel: 283-3028 (Area Code 613)

PRECISION ELECTRICAL MEASURING INSTRUMENTS

The techniques for the absolute measurement of electrical units are so sophisticated and time-consuming that these determinations are commonly made at intervals only by national standardizing laboratories such as the National Bureau of Standards in the United States and the National Research Council in Canada. Both NBS and NRC maintain working standards against which the standards maintained by other government agencies and industry may be compared.

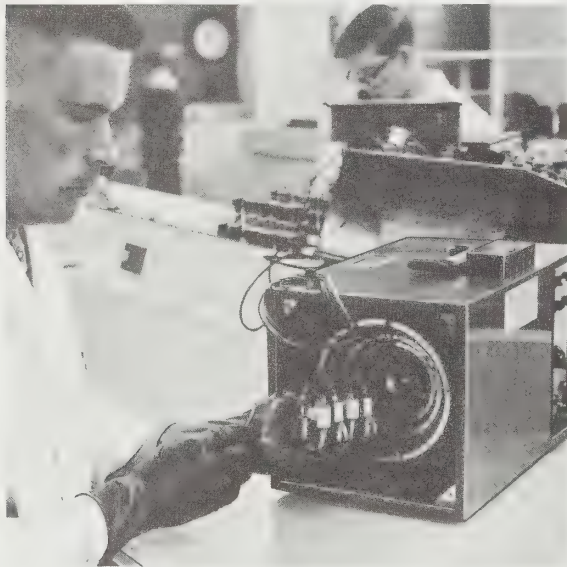
Guildline Instruments Ltd. produces such standards and associated equipment and instruments for a broad range of exacting measurements.

The standard of voltage maintained by both industry and the national laboratories is the saturated standard cell. When banks of these cells are kept in a closely controlled temperature environment, their individual values may be averaged and established to within one part in one million of the national standard. Such cells require careful treatment—they must be housed in enclosures similar to the Guildline Series 9152 constant-temperature standard cell enclosures.

Because the voltage to be measured is invariably different from that of the standard cell, a device known as a DC potentiometer is used to measure unknown voltages directly, with reference to a standard cell. The most accurate and sophisticated unit available today is the Guildline Type 9144 Dauphinee DC potentiometer, conceived by Dr. T. M. Dauphinee of Canada's National Research Council. More than 200 of these units are used in the United States, Australia and Canada.

The company is exhibiting superior measuring potentiometers, designed to be self-checked by the user. All instruments incorporate switching and additional taps which make certifying a ratio device relatively simple.

Also on display is the Guildline Type 9700 Series Master DC volt ratio box, similar to the master volt ratio box at the National Bureau of Standards but immersed in temperature-controlled, circulated oil to reduce the effect of self-heating on ratios to less than 1 ppm and to eliminate ratio change because of ambient temperature changes. Such an instrument is necessary for the high-accuracy measurement of voltages above the normal range of DC potentiometers.



A rubber-gloved technologist eases four Guildline voltage cells inside the triple-walled, thermally insulated 9152/P4 constant-temperature cell enclosure. An electronic temperature control maintains temperature within one-hundredth of a centigrade degree so that voltage output of each of the four cells does not vary by more than half a microvolt.

Represented by:

Hallmark Standards Inc.
1995 Palmer Avenue
Larchmont, New York, 10538
Tel: 834-6630 (Area Code 914)

Applied Measurements Inc.

P.O. Box 306
86 Hayward Road
Acton, Massachusetts, 01720
Tel: 263-2766 (Area Code 617)

MICROWAVE DEVICES INC.

6120 Metropolitan Boulevard East
Montreal, Quebec, Canada
Tel: 254-2711 (Area Code 514)

MICROWAVE COMPONENTS

Since 1961 Microwave Devices Inc. (M.D.I.) has been developing and manufacturing many types of microwave components to help meet a sharply increasing commercial and military demand.

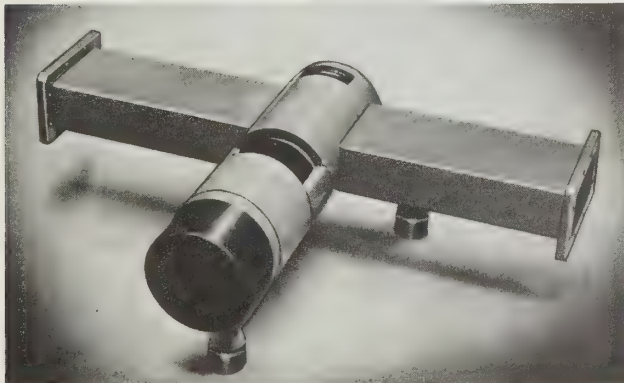
The company designs and manufactures transmission lines and microwave components, sub-assemblies and instruments in the frequency range 250 to 12,400 mc. Range of waveguide size is WR-90 to WR-650. M.D.I. also manufactures, aligns and tests microwave components and sub-assemblies to customer specifications.

On display are waveguide components in rectangular and circular waveguide, including fixed and movable terminations, fixed attenuators, variable attenuators — both calibrated and uncalibrated, band pass filters and band rejection filters, movable shorts, adjustable tuners and other components.

Coaxial components on display include fixed attenuators, low pass filters, waveguide adapters and fixed detector mounts.

M.D.I. has supplied microwave components and instruments for the installation, maintenance and operation of a number of microwave communications systems in Canada, including the vast system stretching from Montreal westward to Vancouver.

M.D.I. offers prompt, inexpensive engineering and fabrication assistance on components.



This precision waveguide attenuator is one of the several microwave components displayed by Microwave Devices Inc.

STARK ELECTRONIC INSTRUMENTS LIMITED

P.O. Box 670
Ajax, Ontario, Canada
Tel: 942-2120 (Area Code 416)



A completely solid-state electronic voltmeter, Stark Electronic Instruments Limited Model 1604 is a portable, general purpose instrument with a wide measuring range and broad frequency response.

SOLID-STATE TEST EQUIPMENT

Stark Electronic Instruments Limited, established more than 30 years ago, manufactures a comprehensive line of electrical and electronic test equipment.

The Stark Model 1604, a completely solid-state electronic voltmeter, is a portable, general purpose instrument, capable of accurate measurements over a wide range of voltage (AC and DC), current (DC) and resistance. Its wide measuring range, various functions and broad frequency response make it useful in a variety of applications. High input impedance both as a DC and AC voltmeter ensures negligible effect on the most critical circuits during measurements.

The input is fed to a highly accurate voltage divider. Part of this divider is tapped off and connected to the internal amplifier with an input impedance of approximately 500 megohms. The meter movement is in the feedback loop of the instrument, so indications are directly proportional to the amplitude of the input signal.

The Starkit Model OSK-3 general purpose oscilloscope, designed for both educational and industrial use, features a three-position vertical input attenuator, push-pull operation with ample vertical positioning and extremely wide horizontal positioning. Built-in one-volt peak-to-peak test voltage is accurately calibrated. Direct access to vertical plates through terminal screws on the cabinet side and facility for external sync input are other features.

Stark's Model PS-503 regulated power supply features B+ and C- output, and DC outputs monitored by large, easy-to-read front panel meters. The current limiter provides protection for the supply and connected circuitry. The B+ output is switchable from 0-400VDC at 150 ma to 0-40VDC at one ampere. The instrument may be used in both laboratory and classroom.

The Stark company has engineered many special products to meet unique and demanding specifications required by modern technology. Products manufactured include test panels, multi-meters, signal generators, tube testers and oscilloscopes.

Represented by:
Johnson Associates Inc.
81 Merrimack Street
Lowell, Massachusetts, 01852
Tel: 452-0413 (Area Code 617)

WELWYN CANADA LIMITED

1255 Brydges Street
London, Ontario, Canada
Tel: 451-9490 (Area Code 519)

RESISTORS, ATTENUATOR PADS, INTEGRATED CIRCUITS

Welwyn Canada Limited produces resistors of all kinds and in practically all recognized materials, shapes and finishes. For more than 10 years the company has been selling resistors in the United States, and in 1964 more than 60 per cent of the company's resistor production went to U.S. customers.

In May 1963 the company opened a plant at Westlake, Ohio, near Cleveland and is now planning further expansion. Welwyn's 12 regional offices in the United States enable electronic firms to place and receive orders quickly.

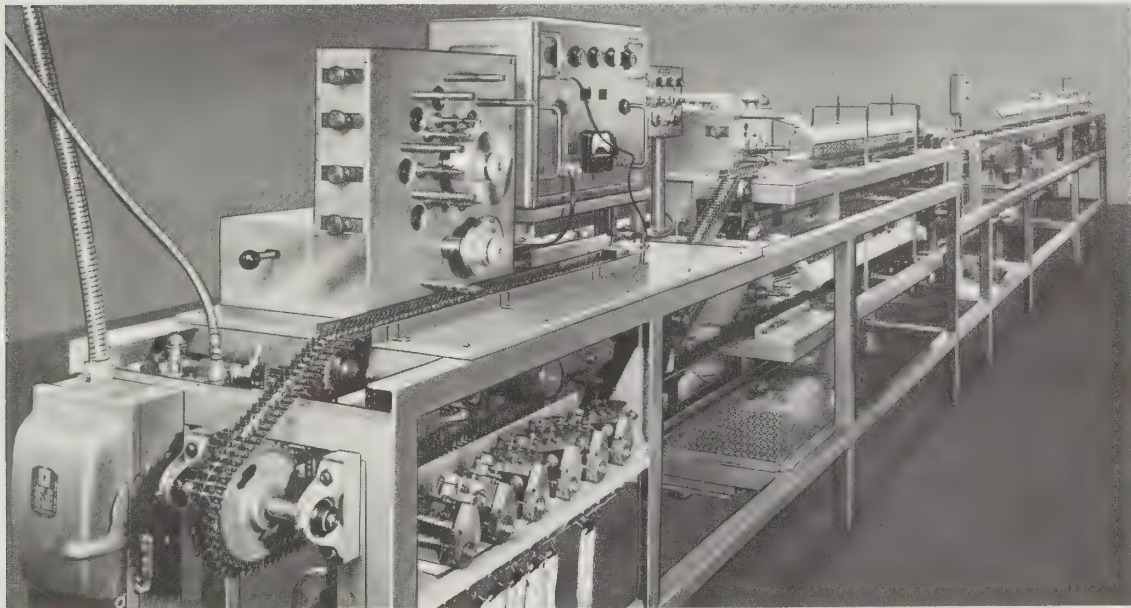
Welwyn is displaying a comprehensive range of resistors, as well as attenuator pads and integrated circuits.

The company's miniature molded metal oxide resistors are designed specifically for computers, instruments, communications equipment and other industrial electronic applications. The improved performance and reliability of these resistors make them ideal replacements, with savings in costs and space. They are manufactured to meet the requirements of MIL-R-22684.

The development of the tin oxide resistor was undertaken to achieve a stable, rugged conducting film providing reliability with a minimum dependence on the enclosure used. As a result, the molded enclosure gives additional mechanical ruggedness, electrical insulation and uniform dimensional characteristics for handling in automatic machinery.

Welwyn oxide resistors are molded to give maximum dielectric breakdown properties for consistency in size, particularly where automatic insertion equipment is employed, and for precise color band identification. These resistors offer exact physical size replacements for carbon composition units.

Welwyn attenuators and printed circuits, made to the same exacting standards, are also on display.



At the London, Ontario, plant of Welwyn Canada Limited, this automated assembly machine performs all final operations on resistors, including color banding, final measure, sorting, top coating, inspection and curing.

Represented by:
Cirolia-LeBlanc Sales Co. Inc.
976 Main Street
Waltham, Massachusetts, 02154
Tel: 893-2742 (Area Code 617)

John Hatfield
Welwyn International Inc.
811 Sharon Drive
Westlake, Ohio, 44091
Tel: 871-7980 (Area Code 216)

CANADA PROBES SPACE MYSTERIES

The mysteries of outer space are being explored in four Canadian projects. Canada is producing sounding rockets to probe the upper atmosphere. It is co-operating with the United States in the High Altitude Research Project (HARP) to determine whether guns can be used to fire missiles into space. Again with the United States, Canada is assisting in a weather reconnaissance satellite program. Later this year Canada's second sounding satellite — Alouette II — will be launched.

At Fort Churchill, Manitoba, scientists from four Canadian universities and the National Research Council are studying the troublesome auroral zone by firing sensitive measuring instruments 40 to 130 miles up into this zone which is too high for aircraft and balloons to explore and too low for satellites. The study of the auroral zone's electrical particles is important for improving radio communications so often hindered by this zone.

The Black Brant solid-propellant rocket used in the auroral project is made in Winnipeg. Canada is willing to sell Black Brant research rockets to other countries and to research organizations such as the National Aeronautical Space Administration and the European Space Research Organization.

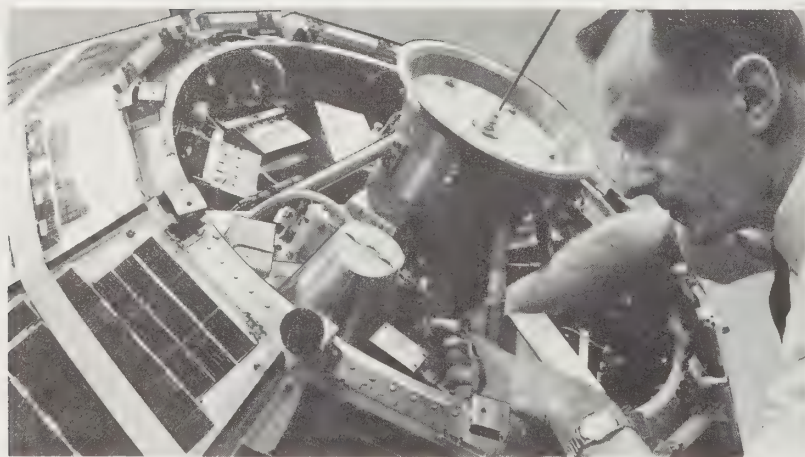
On a converted sugar plantation in Barbados, Canadian scientists are proving that the gun is not obsolete in the space age. Sixteen members of the Space Research Institute of McGill University are working with U.S. scientists to determine the applicability of using guns to launch probing vehicles into the ionosphere.

Using an ex-naval gun with a 16.5-inch bore and an extended barrel of more than 100 feet, McGill-designed projectiles have attained heights of 70 miles. HARP is now studying the possibilities of incorporating a rocket in the projectile to reach even greater heights.

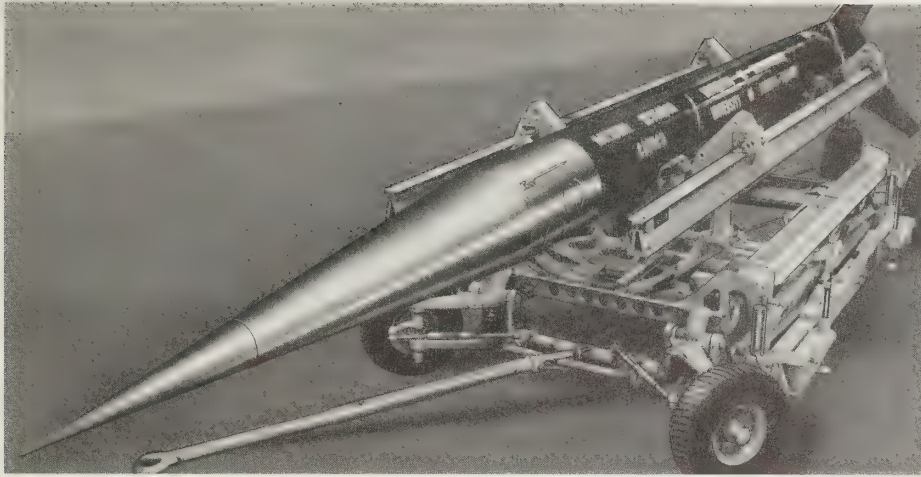
Four Canadian meteorological ground stations will soon add to the world's knowledge of weather forecasting by producing high quality, detailed pictures of the earth's surface from satellites more than 300 miles in space. Up to now, two ground stations operated by the Department of Transport and the National Research Council — one at Frobisher Bay in the Arctic, the other at Ottawa — have co-operated with the United States in receiving and processing photographs taken from the Nimbus A satellite.

The Canadian-made equipment has aroused considerable interest among other users of the Automatic Picture Transmission System (APT) of the American meteorological satellites. The equipment consists of a simple yagi-type, azimuth-elevation mounted antenna, pointed by a novel antenna programmer.

Following the success of Alouette I, a Canadian-built sounding satellite launched September 28, 1962, Canada's Alouette II will be launched later this year. An improved version of its predecessor, it will be equipped with a 240-foot antenna and solar cells substantially better than those of the first Alouette which are still operating after three years of orbiting in space.



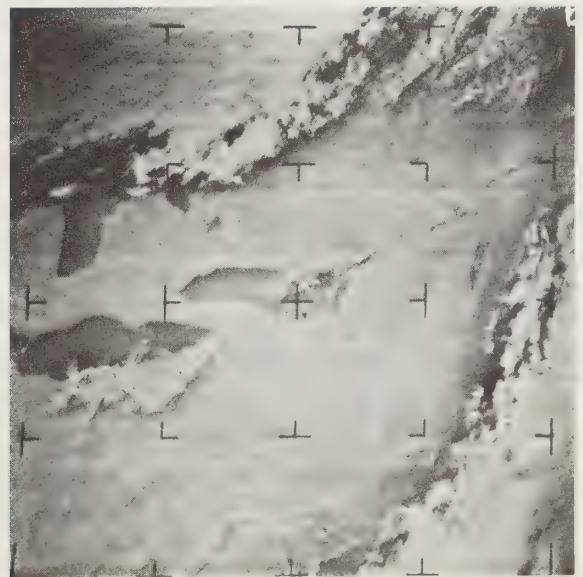
A satellite technician at the Defence Research Board, Ottawa, works on Alouette II, scheduled to be launched later this year.



Black Brant rocket before and after it was shot into space in northern Canada to measure conditions in the auroral region, about 130 miles above the earth.



Big blast in Barbados fired Martlett missile to a record height of 430,000 feet. The 16.5-inch naval gun with its 100-foot muzzle has developed breech pressures as high as 70,000 psi.



The Great Lakes as photographed by the weather satellite Nimbus A at an altitude of 380 miles.

INFORMATION

Officials of the Canadian Department of Trade and Commerce and representatives of participating firms in the 1965 Northeast Electronics Research and Engineering Meeting at Boston will answer inquiries from interested businessmen, and information is also available from the following Canadian trade offices in the United States.

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